

REPLACEABLE PLATE EXPANDED THERMAL PLASMA APPARATUS AND METHOD

ABSTRACT OF THE DISCLOSURE

A deposition process comprises determining a target process condition within a chamber of an expanding thermal plasma generator for plasma enhanced chemical vapor deposition of a coating on a substrate; the generator comprising a cathode, replaceable cascade plate and anode with concentric orifice; and replacing the cascade plate with another plate having a configured orifice to effect the identified target process condition; and generating a plasma at the target process condition by providing a plasma gas to the plasma generator and ionizing the plasma gas in an arc between cathode and anode within the generator and expanding the gas as a plasma onto a substrate in a deposition chamber. A deposition apparatus for generating a controllable plasma; comprises a deposition chamber; adapted to be maintained at subatmospheric pressure; an article support within the deposition chamber; an expanding thermal plasma generator comprising a cathode, a single cascade plate and an anode and a communicating orifice through the cascade plate, the orifice having a length of 1mm to less than 20 mm.